

Prevalence, causes, and correlates of traumatic dental injuries among seven-to-twelve-year-old school children in Dera Bassi

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Abstract

Aim: The paper aims to present a study conducted in Dera Bassi, Mohali, India. The purpose of the study was to ascertain the prevalence of traumatic dental injuries (TDI) in children of age group 7-12 years in private schools in Gulabgarh village. **Material & Method:** Age & sex distribution, etiological factors, risk factors and cause of injury were the parameters taken into consideration. The data collected was processed and analyzed using the SPSS statistical software program. **Results:** The overall prevalence of dental trauma was 14.5%, amongst the 880 subjects examined, out of which, 63.2% males and 36.4% females were found to be affected. The maxillary central incisor was found to be most commonly affected tooth (43.8%). The most common cause of injury reported was fall during playing (37.5%). **Conclusion:** Enamel fracture was most prevalent (50%). No risk factor was significantly higher than others; however children with Angle's class II div 1 malocclusion exhibited greater risk factor for traumatic injuries.

Keywords: Traumatic injuries, dental trauma, prevalence, examination

Introduction

The existence of dental caries as a major oral health problem in children has for long been established, but the prevalence of dental trauma, which is a serious dental public health problem, has not been studied often. Despite its importance, there are few reports available on the epidemiology of injuries to the teeth of children in developing and industrialized countries, especially when compared to the epidemiological data on dental caries and periodontal diseases.^[1]

Facial trauma results in fractured, displaced or lost teeth and can have significant negative functional, esthetic, and psychological effects on children.

The relationship between age, sex, tooth involved, type of fracture incurred, cause of injury, risk factors, and so on, need to be focused upon as these correlates of traumatic injury are not routinely investigated.

Furthermore, dental injury to primary teeth can result in complicated problems to the underlying permanent teeth, such as, hypoplasia, discoloration, and delay in eruption time, and tooth malformation.^[2] In addition to pain and possible infection, the consequence of dental trauma (especially incisors) includes alteration in physical appearance, speech defects, and emotional impacts, thus affecting the child's quality of life.^[3,4]

The seven-to-twelve year age group is considered the most prone to any form of dental trauma. Furthermore, boys sustain dental trauma almost twice as much as girls, exhibiting significant gender differences with regard to dental trauma experience. The main cause of dental injuries is falls and collisions, sporting activities, violence, and traffic accidents.^[5,6]

Studies have affirmed that increasing overjet, inadequate lip coverage, class II division 1 occlusal relationship, and so on, are the most common risk factors for dental trauma.^[1,7-9]

In spite of a high frequency, the data on the prevalence of dental traumatic injuries is sparse and no single study highlights all the possible factors and correlates together.

This study aims to explore the relationship between various factors and correlates of dental trauma in children in the age group of seven to twelve years in Dera Bassi.

Materials and Methods

The sample consisted of 880 children in the age group of seven to twelve years, enrolled in private schools in Dera Bassi. There were 495 boys and 385 girls. The children examined belonged to the middle- and low-income groups. The examinations were performed in the schools under

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natural lighting, with the aid of mouth mirrors and disposable tongue depressors. Only objective findings at the examination were registered as traumatic injuries. The data registered were: Age, sex, risk factors, cause of injury, type of injury, and the tooth involved.

A letter was sent to the parents of the selected children explaining the aim, characteristics, and importance of the study, and asking for their participation. The chronological age was the criterion for deciding the age group. Risk factors and cause of injury were noted by asking questions regarding the history of injury. Those subjects who showed clinical evidence of trauma, but could not give a proper history were excluded from the study.

Injuries to permanent teeth were categorized according to classification by Ellis & Davey (1960) (WHO) classification.

The dental examination included all permanent teeth. All teeth were dried before examination to increase the accuracy of the diagnosis. The examiner assessed the type of damage sustained, any treatment that had been carried out, whether the incisal overjet was greater than 5 mm and whether lip coverage was adequate.

The examination was conducted in a uniform fashion beginning from the maxillary right quadrant to the mandibular in a clockwise direction. The occlusion of the subject was judged using the Angle's Classification. The proclination or overjet was measured using a pair of vernier calipers and the measurements were recorded in millimeters. The data were subsequently processed and analyzed using the SPSS statistical Software program. The Chi – Square test was employed to evaluate the results.

Results

The overall prevalence of dental trauma was 14.5%, with a much higher data in males (63.2%) as compared to females (36.4%), the difference being statistically significant ($p < 0.05$) [Figure 1]. The maxillary arch was involved in 93.7% of the cases. In 84.4% of the patients only one tooth was involved and two teeth were involved only in 15.4% of the patients, with no case reporting trauma in more than two teeth. The most common types of teeth affected were the permanent maxillary central incisors; the maxillary right central incisor being the most commonly affected (43.8%), with significantly higher ($P < 0.05$) [Figure 2]. Enamel fracture i.e. Ellis Class 1 was the most common type of fracture seen in affected patients [Table 1]. Types of fractures which could not be conclusively diagnosed in the set up of the survey were designated collectively as Unspecified (eg. Displacement, injuries to the supporting tissues, suspected root fractures etc.). No risk factor was found to be significantly more prevalent, but Angle's Class II div 1 patients (21.9%) experienced the maximum number of injuries. The most

frequent cause of injury was falls. Falls when playing (37.5%) were significantly higher than other causative factors like fighting or bicycle falls [Figure 3]. Medical problems ranging from syncope to cerebral palsy, thus predisposing the children to falls also accounted for considerable number of

Table 1: Type of tooth trauma

	Number	%
Enamel fracture (class 1)	64	50
Crown fracture without pulpal involvement (class 2)	26	20.3
Crown fracture with pulpal involvement (class 3)	17	13.2
Avulsion (class 5)	6	4.6
Fracture unspecified	15	11.9

Chi square = 43.0, $P < 0.05$

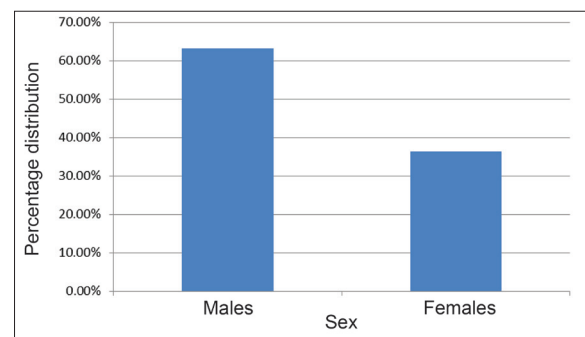


Figure 1: Male female ratio, Males=63.2%, Females=36.4%, Chi square=4.02, $P < 0.05$

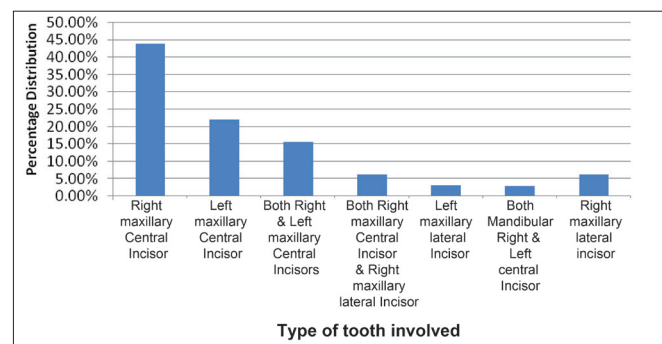


Figure 2: Type of tooth injured

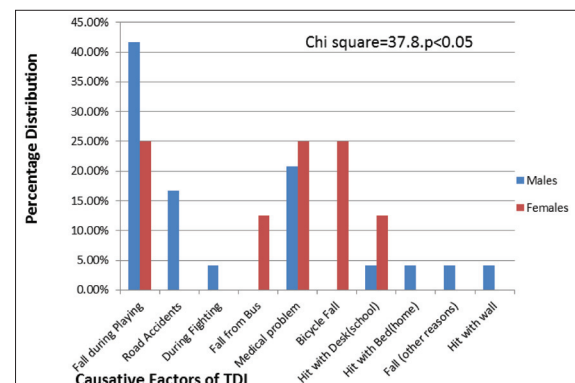


Figure 3: Cause of Injury, Chi square=37.8, $P < 0.05$

TDI among the examined cases. A comparison of causative factors was also made between males and females, although no significant findings were obtained. Fifty-two percent of the patients encountered injury in and around their home, 41% in school, and in 7% of the patients, the information was not reliable enough.

Discussion

The findings of this study conform to the available literature. Our finding of a greater frequency of traumatic dental injuries in boys is supported by a majority of previous studies.^[10,11] Out of 880 patients examined, 81 boys and 47 girls were found to be affected. The boys were thus almost twice times more likely to have dental injuries than girls. This might be explained by observations that boys participate in more aggressive type of games and contact sports. Girls are less prone to traumatic dental injuries as our social setup and cultural reservations do not allow them to be involved in vigorous outdoor activities.

This study has shown that maxillary teeth are more frequently traumatized than mandibular teeth; this is generally supported by the existing literature. The most frequently affected teeth are the maxillary central incisors. This finding corroborates the earlier findings.^[12,13] This probably relates to the vulnerable position of the maxillary central incisors. In addition, these teeth are frequently protruded and may have inadequate lip coverage.^[1,14] In our study also, although no risk factor was found to be significantly higher than the others, the patients with Angle's Class II Division 1 were found to be more prone to dental trauma. The reason is the exposure of central incisors in such patients.

Falls were the most frequent cause of trauma in all age groups and this was generally supported by other studies.^[4,5,15] Falls when playing being the most common causative factor (37.5%) followed by injury during fighting and bicycle falls.

The most common type of injury was found to be the enamel fracture, similar to that reported by other authors.^[16,17] However, there are studies showing that fracture of the enamel dentin without pulpal involvement is the most common type of injury in permanent dentition.^[18]

Identifying the etiological factors makes it possible to establish preventive measures aimed at avoiding future injuries. This is especially so when in today's scenario the concept of conservation, retention, and prevention of tooth structures is topmost on the list of priorities. The teaching of injury epidemiology and injury prevention to healthcare workers and to the parents should be improved. Health promotion policies should aim to create an appropriate and safe environment as well as increase awareness of such hazards. Dental emergencies should be dealt with high proficiency and should provide prompt standard care, as such injuries should be the target

of dental emergency care providers. All these efforts are thus expected to improve the present scenario and bring down the figures we have in our studies.

Conclusion

The examination of 7-12 year old school children for traumatic injuries in Dera Bassi (India) concluded that males were more prone to injury compared to females. Among the hard structures of the dentition, enamel fracture was the most common type of injury. The permanent maxillary central incisors were found to be the most commonly traumatised teeth in children. Higher prevalence of injuries occurred at home compared to school. More injuries occurred due to falls while playing. Children with Angles Class II div 1 malocclusion was seen as a major risk factor among affected children

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